

M o n t h l y M a r i n e B i o t o x i n R e p o r t March 2003

Technical Report No. 03-12

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of March 2003. Ranges of toxin concentrations are provided for the paralytic shellfish poisoning (PSP) toxins and for domoic acid (DA). Estimates are also provided for the distribution and relative abundance of *Alexandrium*, the dinoflagellate that produces PSP toxins, and *Pseudo-nitzschia*, the diatom that produces domoic acid. Summary information is also provided for any quarantine or health advisory that was in effect during the reporting period.

Please note the following conventions for the phytoplankton and shellfish biotoxin distribution maps: (i) All estimates for phytoplankton relative abundance are qualitative, based on sampling effort and percent composition; (ii) All toxin data are for mussel samples, unless otherwise noted; (iii) All samples are assayed for PSP toxins; DA analyses are performed as needed (i.e., on the basis of detected blooms of the diatoms that produce DA); (iv) Please refer to the appropriate figure key for an explanation of the symbols used on the maps.

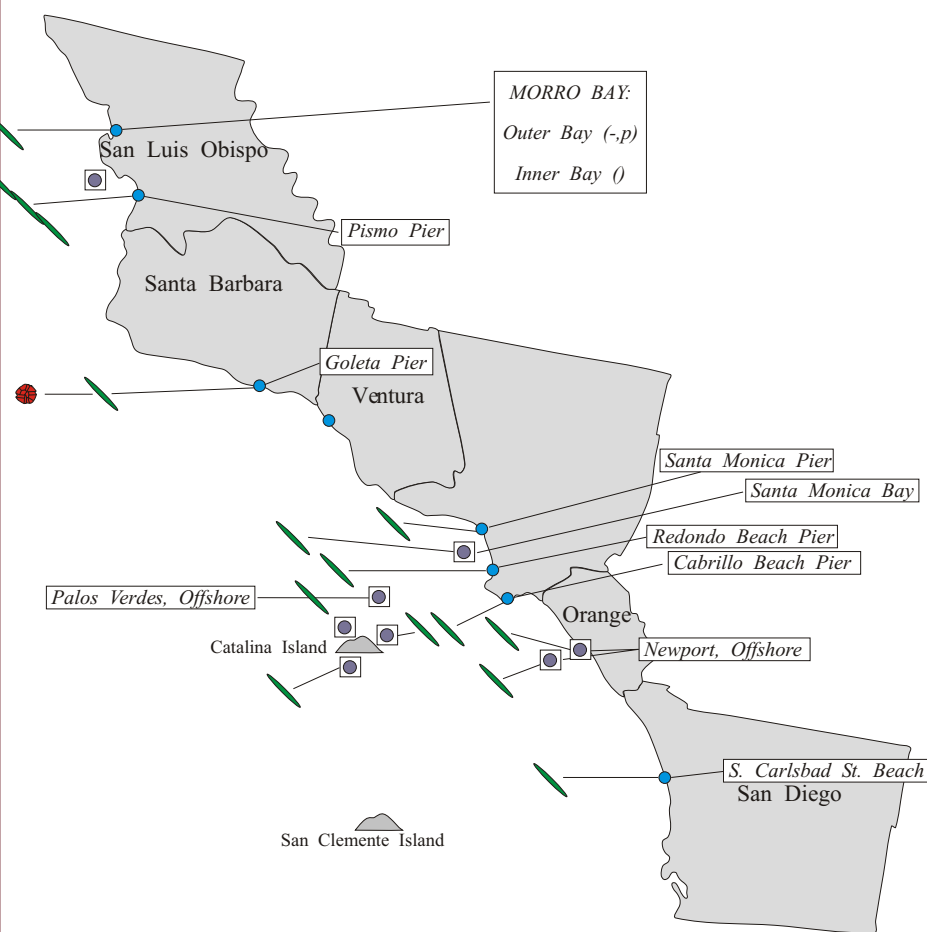
Southern California Summary:

Paralytic Shellfish Poisoning:

Alexandrium was absent from most southern California sites during March, with the exception of a small number of cells observed

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Figure 1. Distribution of toxin-producing phytoplankton in Southern California during March, 2003.



Relative Abundance of Known Toxin Producers

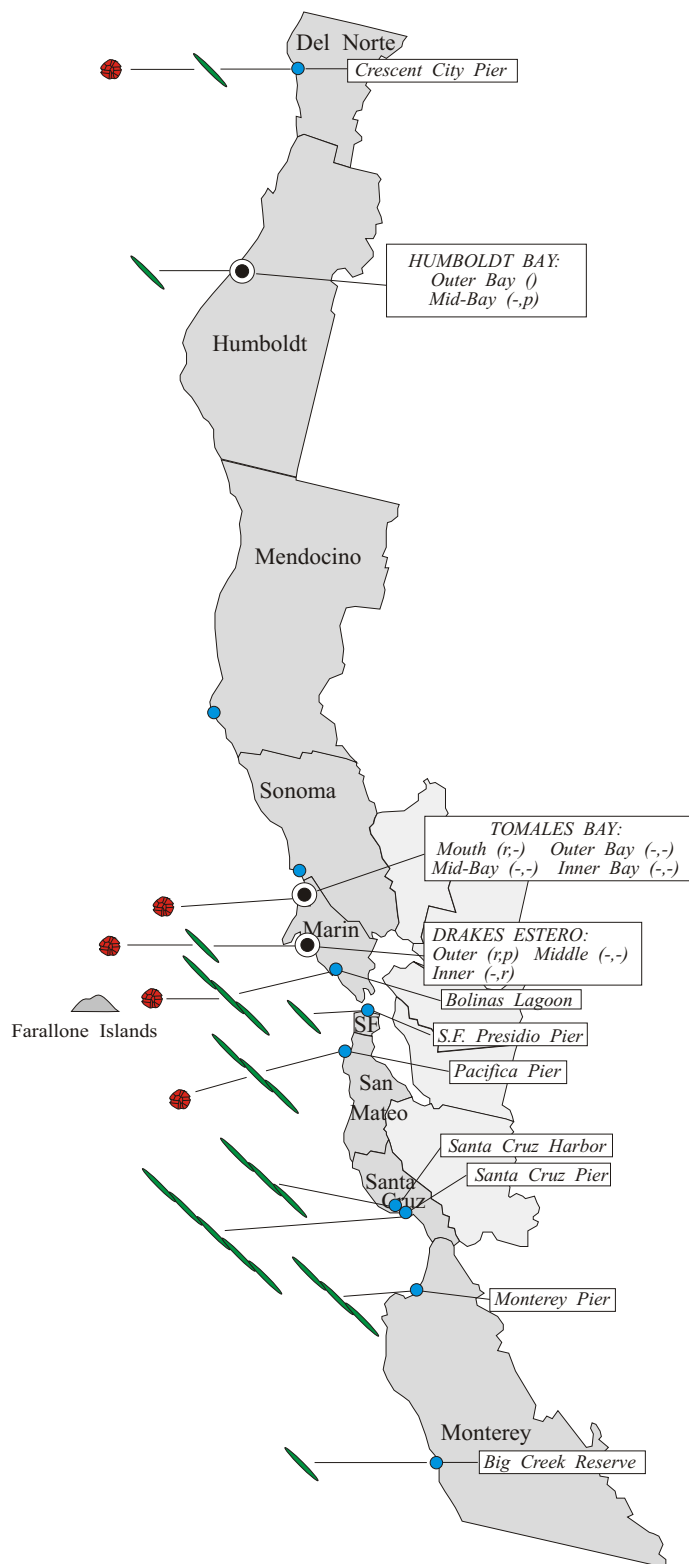
Alexandrium Species		Pseudo-nitzschia Species	
	Rare (less than 1%)		Present (less than 10%)
	Present (between 1% and 10%)		Common (between 10% and 50%)
	Common (between 10% and 50%)		Abundant (greater than 50%)
	Abundant (greater than 50%)		

MONTHLY SAMPLING STATIONS:

- Single Sampling Station
- Multiple Sampling Stations
- Offshore Sampling Station

For areas with multiple sampling stations, species abundance at each station is represented as follows:
(a,p) = Abundance for *Alexandrium* and *Pseudo-nitzschia*.
e.g., (c,p) = common, present; (a,-) = abundant, not observed

Figure 2. Distribution of toxin-producing phytoplankton in Northern California during March, 2003.



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at Goleta Pier (Santa Barbara County).

A low level of PSP toxins (39 ug) was detected in mussels from Goleta Pier on March 19 (Figure 3). PSP toxicity was absent from all other shellfish samples collected at sites along the Southern California coast throughout the month.

Domoic Acid:

Low numbers of *Pseudo-nitzschia* were observed along most of the southern California coast, including Catalina Island offshore, during March (Figure 1). The relative abundance and cell number for this diatom increased throughout the month at Pismo Pier (San Luis Obispo County) and was as high as any other diatom observed along the Southern California coast.

Domoic acid was not detected in any mussel or oyster samples during March (Figure 3). However, thanks to the effort of program volunteer Bill Weinerth, we have continued to detect persistently high levels of domoic acid in the viscera of lobster from Anacapa Island (52 ppm on March 14).

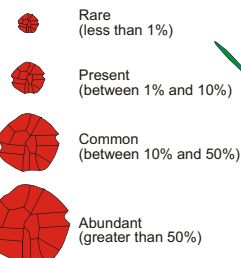
Nontoxic Events:

The nontoxic species of phytoplankton consisted primarily of the diatoms *Melosira*

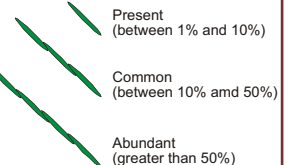
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Relative Abundance of Known Toxin Producers

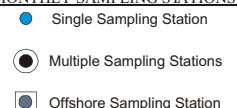
Alexandrium Species



Pseudo-nitzschia Species



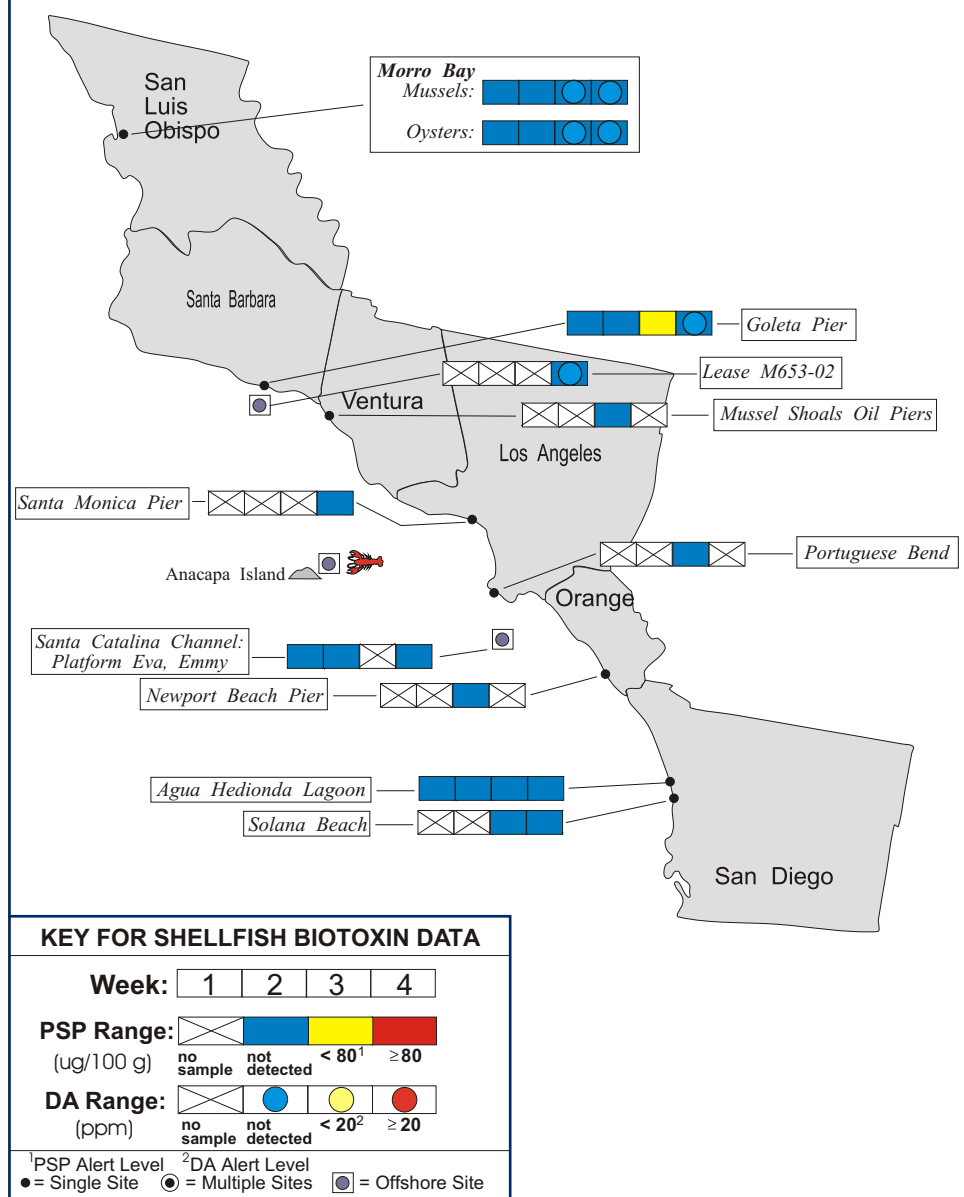
MONTHLY SAMPLING STATIONS:



For areas with multiple sampling stations, species abundance at each station is represented as follows:

(A,P) = Abundance for *Alexandrium* and *Pseudo-nitzschia*.
e.g., (c,p) = common, present; (a,-) = abundant, not observed

Figure 3. Distribution of shellfish biotoxins in Southern California during March, 2003.



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and *Chaetoceros* from San Luis Obispo through Los Angeles, respectively. Los Angeles seemed to be a transition zone where dinoflagellates became the most abundant group. High numbers of *Ceratium furca* were observed along the coast of Los Angeles and San Diego. *Lingulodinium polyedrum* (formerly *Gonyaulax polyedra*) was also abundant in

Los Angeles (Palos Verdes) by March 13 and *Prorocentrum micans* was dominant at the end of the month along the northern San Diego coast at South Carlsbad State Beach.

Northern California Summary:

Paralytic Shellfish Poisoning:

Low numbers of *Alexandrium* were observed at Crescent City (Del Norte County), at several sites in Marin County,

and at Pacifica (San Mateo County) during March (Figure 2). Low levels of PSP toxins were associated with observations of this dinoflagellate in outer Drakes Estero (Figure 4).

The low levels of PSP toxins detected in the Drakes Bay region of Marin County in February continued through March. The levels of these toxins at the sentinel mussel sites in Drakes Estero were slightly higher in March.

Domoic Acid:

The elevated numbers of *Pseudo-nitzschia* observed in February continued through March at sites inside Monterey Bay. In addition, the relative abundance of this diatom increased at sampling sites in Marin and San Mateo counties.

The relative abundance of *Pseudo-nitzschia* appeared to decline at the Monterey Pier in the beginning of March and increased again by March 22. Researchers at U.C. Santa Cruz also reported high densities of this diatom at the Santa Cruz Pier (Figure 2).

The high concentrations of *Pseudo-nitzschia* observed by U.C. Santa Cruz at the Santa Cruz Pier coincided with increased numbers of this diatom in a volunteer's sample from the Monterey commercial pier. These observations prompted the analyses of shellfish samples for domoic acid.

Domoic acid was detected in shellfish samples from two Santa Cruz locations during March (Figure 4). Elevated concentrations of domoic acid were detected in mussels from the Santa Cruz

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Pier on March 12 (32 ppm) and March 26 (68 ppm). A mussel sample from Natural Bridges State Park also contained domoic acid at the federal alert level of 20 ppm.

Nontoxic Events:

The nontoxic species were low in relative abundance along most of the Northern California coastline with some notable exceptions. The dinoflagellate *Gonyaulax spinifera* became abundant along the Del Norte coast at Crescent City, although the diatom *Chaetoceros* was also common. The diatoms *Coscinodiscus* and *Ditylum* were common and in relatively high numbers at sites in Marin, San Francisco, and San Mateo counties. The *Prorocentrum* bloom observed in February in Tomales Bay continued through March.



QUARANTINES:



There were no special quarantines or health advisories in place in February 2003.

California implements an annual quarantine each year from May 1 through October 31, which applies only to sport-harvested mussels along the entire California coastline, including all bays and estuaries. Marine Biotxin Monitoring Program participants collect samples throughout the year. The Annual Quarantine does not affect the commercial shellfish growing areas in

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Figure 4. Distribution of shellfish biotoxins in Northern California during March, 2003.

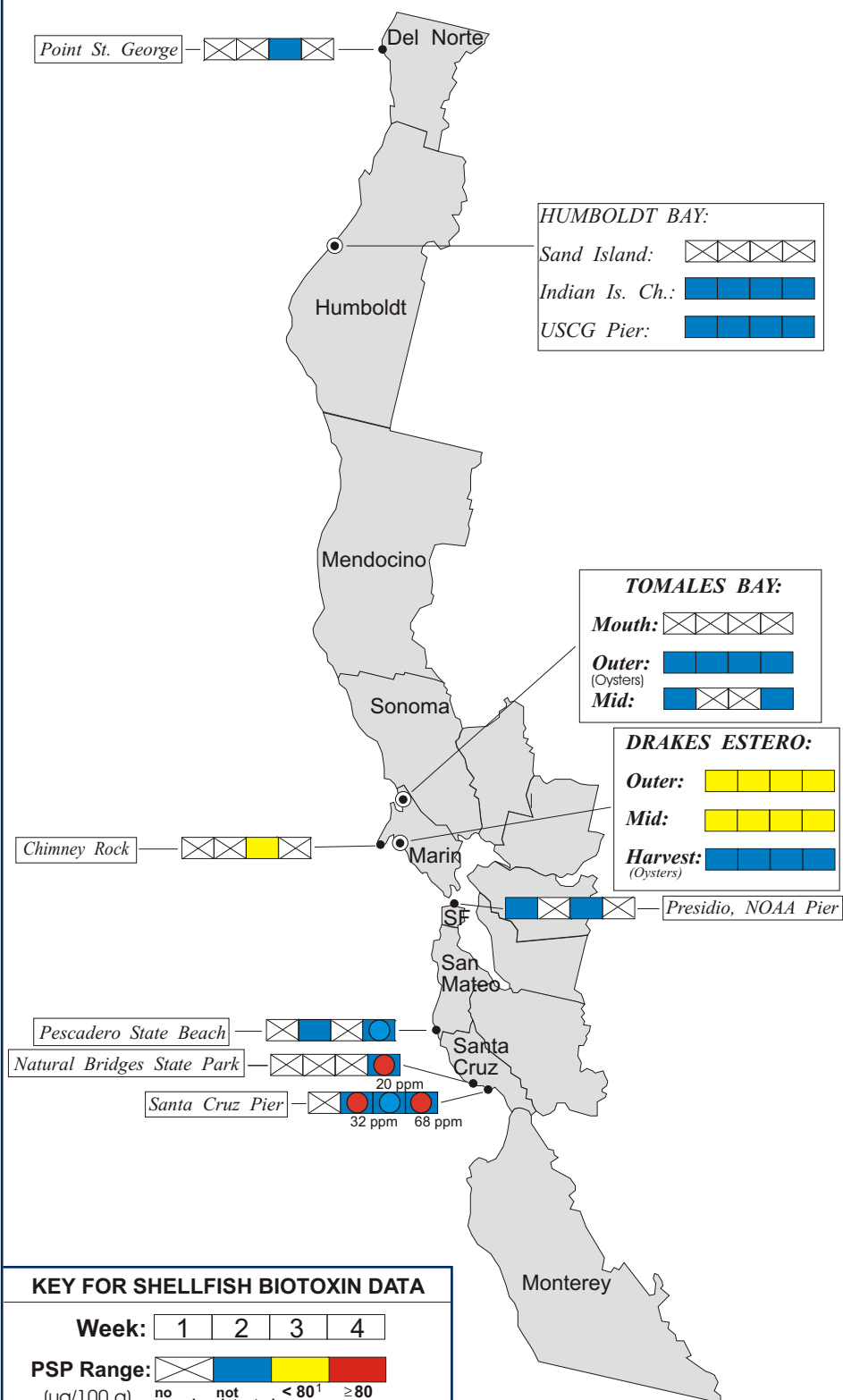


Table 1. California Marine Biotoxin Monitoring Program participants submitting shellfish samples during March, 2003.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	1
Humboldt	Coast Seafood Company	8
Mendocino	None Submitted	
Sonoma	None Submitted	
Marin	Cove Mussel Company	1
	Hog Island Oyster Company	6
	Johnson Oyster Company	21
	Marin Oyster Company	4
San Francisco	San Francisco County Health Department	2
San Mateo	San Mateo County Environmental Health Department	2
Santa Cruz	U.C. Santa Cruz	4
	Santa Cruz County Environmental Health Department	1
Monterey	None Submitted	
San Luis Obispo	Williams Shellfish Company	9
Santa Barbara	U.C. Santa Barbara Marine Science Institute	4
	Santa Barbara Mariculture Company	1
Ventura	Ventura County Environmental Health Department	1
Los Angeles	Los Angeles County Health Department	2
Orange	Ecomar, Inc.	3
	Orange County Health Care Agency	1
San Diego	Carlsbad Aquafarms, Inc.	3
	CDHS Volunteer (Paul Sims)	2

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California. All commercial shellfish growers certified by the State of California are required to submit routine (at least weekly) samples for biotoxin analysis, allowing us to closely monitor the presence of any toxin. Harvesting closures are imposed if toxin levels reach the federal alert level.

Consumers of Washington clams, also known as butter clams, are cautioned to eat only the white meat. We recommend that persons engaged in the sport-harvesting of any bivalve shellfish (e.g., mussels, clams, scallops) contact the Department's "Shellfish Information Line" at 1-800-553-4133 or (510) 412-4643 for a current update on marine biotoxin activity.

Persons taking any clams or scallops are advised to remove and discard the dark parts (i.e., the digestive organs or viscera). Only the white meat of clams and scallops should be prepared for human consumption.



The Marine Biotoxin Monitoring and Control Program, managed by the California Department of Health Services, is a state-wide effort involving a consortium of volunteer participants. The shellfish sampling and analysis element of this program is intended to provide an early warning of shellfish toxicity by routinely assessing coastal resources for the presence of paralytic shellfish poisoning (PSP) toxins and domoic acid.

The Phytoplankton Monitoring Program is a state-wide program designed to detect toxin producing species of phytoplankton in ocean water before they impact the public. The phytoplankton monitoring and observation effort can provide an advanced warning of a potential toxic bloom, allowing us to focus sampling efforts in the affected area before California's valuable shellfish resources or the public health is threatened.

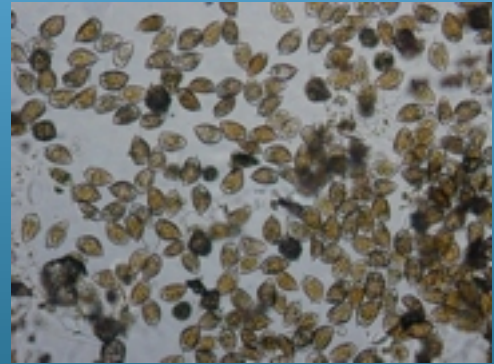
*For More Information Please Call:
(510) 412-4635*

*For Recorded Biotoxin Information Call:
(800) 553 - 4133*

Table 2. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during March, 2003.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	4
Humboldt	Coast Seafood Company	4
Mendocino	CDHS Volunteer (Amy Johnson)	1
Sonoma	Bodega Marine Laboratory	1
Marin	California Department of Fish and Game	3
	CDHS Volunteer (Brent Anderson, Richard Plant)	9
	Johnson Oyster Company	12
Alameda	None Submitted	
San Francisco	CDHS Volunteer (Eugenia McNaughton)	2
San Mateo	San Mateo County Environmental Health Department	2
Santa Cruz	None Submitted	
Monterey	CDHS Volunteer (Jerry Norbn)	2
San Luis Obispo	CDHS Volunteer (Rene and Auburn Atkins)	5
	CDHS Marine Biotoxin Program	1
	Morro Bay National Estuary Program	1
	Tenera Environmental	2
Santa Barbara	U.C. Santa Barbara Marine Science Institute	4
Ventura	Ventura County Environmental Health Department	1
Los Angeles	Los Angeles County Health Department	2
	Los Angeles County Sanitation District	2
	Los Angeles Regional Water Quality Control Board	1
	Catalina Tall Ships Expedition	4
	Catalina Island Marine Institute	1
Orange	Orange County Sanitation District	6
San Diego	San Diego County Environmental Health Department	2

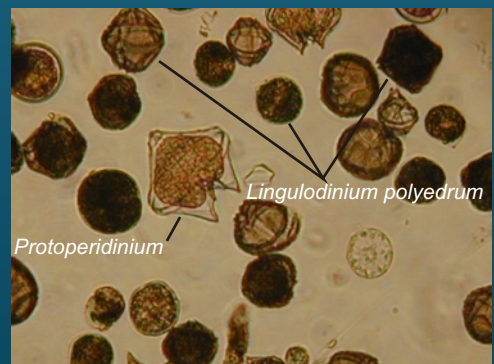
PHYTOPLANKTON GALLERY



A bloom of the dinoflagellate *Prorocentrum micans* continued into March in Tomales Bay, Marin County.



Chains of *Pseudo-nitzschia*, the diatom that produces domoic acid.



The dinoflagellate *Lingulodinium polyedrum* that was abundant along the Los Angeles coast in March. (Note: dark granular bodies are living cells and transparent bodies are dead cells - the outer cell wall only)